

Relation between ionization of the...

31667
S/570/61/000/019/007/008
B107/B104

$K = a + A \cdot \sin Z$; $\Delta f_o F_2 = b + B \cdot \sin Z$. A and B change linearly with the relative number W of sunspots. a and b also increase somewhat as W increases. Table 1 gives the graphically determined values for measurements of the Yuzhno-Sakhalinsk station. Deviation is low in observations made by the stations Alma-Ata, Simferopol', and Yuzhno-Sakhalinsk, somewhat greater with Rostov-na-Donu. The reason might be that up to 1958 a hand-operated ion probe was used in Rostov which did not allow exact measurements of the daily $f_o F_2$ due to the limited frequency range. Result: The linear relation between $f_o F_2$ and $\sin Z$, found by Likhachev, holds for middle latitudes, at least for 40 - 50° north latitude; the formula is preferably set up in two terms. The coefficients are proportional to the solar activity. Checking and physical interpretation of this rule with the aid of data obtained by stations at different latitudes would be of great interest. The relation is hardly suitable for the practical calculation of the daily $f_o F_2$ variation. There are 2 figures, 1 table, and 1 Soviet reference.

Card 2/3

KONNOVA, R.V.

Regularities of the E-layer over southern Sakhalin. Geomag. i
ser. 2 no. 6: 1146-1147 N-D '62. (MIRA 16:1)

Institut zemnogo magnetizma, ionosfery i rasprostraneniya
radiovoln AN SSSR.

(Sakhalin--Sporadic E (Ionosphere))

PUDOVIK, A.N.; MURATOVA, A.A.; KONNOVA, T.I.; FEOKTISTOVA, T.; LEVKOVA,
L.N.

Reactions of esters of alkyl phosphonic acids with halogen-
containing compounds. Zhur.ob.khim. 30 no.8:2624-2630 Ag
'60. (MIRA 13:8)

1. Kazanskiy gosudarstvenny universitet.
(Phosphonic acid)

BOLYSHEV, N.N.; BYKOVA, L.N.; KONNOVA, Ye.N.

Dynamics of readily soluble salts in the complex soils of the chestnut zone
in the Stalingrad-Stepnoye region. Vest.Mosk.un. 8 no.5:101-114 My '53.
(MLR 6:8)

1. Kafedra pochvovedeniya.

(Stalingrad region--Soils) (Soils--Stalingrad region)

(Stepnoye region--Soils) (Soils--Stepnoye region) (Salts, Soluble)

BOLYSHEV, N.N.; SHTINA, E.A.; KONNOVA, Ye.N.

Effect of various salts and their concentrations on algal species.
Vest.Mosk. un. Ser. 6: Biol., pochv. 20 no.2:72-80 Mr-Apr '65.

(MIRA 18:5)

1. Kafedra pochvovedeniya Moskovskogo universiteta.

AUTHORS:

Kost, A. N., Konnova, Yu. V.,
Yershov, V. V., Rukhadze, Ye. G.

SOV/79-29-2-29/71

TITLE:

Reactions of Hydrazine Derivatives (Reaktsii proizvodnykh
gidrazina). XXII. 3-Amino-1-aryl Pyrazolines and Their
Salicylal Derivatives (XXII. 3-Amino-1-arilpirazolin i ikh
salitsilal'nyye proizvodnyye)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 2,
pp 498 - 502 (USSR)

ABSTRACT:

It was demonstrated that 3-amino-1-phenyl pyrazoline (I),
which was synthesized by the authors already earlier, disposes,
like some other hydrazine derivatives, of a bactericidal
activity, that is to say, it inhibits the growth of the
bacilli of human tuberculosis. For this reason the authors
synthesized according to Duffin and Kendall (Ref 2) several
3-amino-1-phenyl pyrazolines by reaction of $\alpha\beta$ unsaturated
nitriles with aryl hydrazines according to the scheme
mentioned. On the basis of some reactions the affiliation
of the unsaturated nitrile apparently takes place in the
first stage of reaction, while cyclization occurs afterwards.

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Reactions of Hydrazine Derivatives. XXII. 3-Amino-1-aryl
Pyrazolines and Their Salicylal Derivatives SOV/79-29-2-29/71

Only small amounts of unstable aminopyrazolines resulted from the synthesis of Duffin and Kendall (Ref 2), which was carried out strictly according to specifications. Hence it follows that it is more favorable not to carry out the reaction in ethyl alcohol but in the higher boiling butyl alcohol. Accordingly, sodium butylate instead of sodium ethylate was used as catalyst. These modifications of reaction permitted an increase in the yield of aminopyrazolines by 20-40% (50-80% of the theoretical one): 3-amino-1-n-tolyl pyrazoline (VI) was obtained by reaction of β -dimethyl-amino propionitrile with n-tolyl hydrazine. The most intense activity against bacilli was exhibited by 1-phenyl-3-aminopyrazoline (I). The 3-aminopyrazolines synthesized readily enter reaction with salicyl-5-bromo salicyl aldehyde and 2-oxy naphthoic aldehyde under formation of bright-colored salicyl amines. Their absorption spectra are given in the figure. Almost all salicyl aminopyrazolines offer precipitations or a green coloration with salts of trivalent iron; many of them produce characteristic precipitations with the salts

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Reactions of Hydrazine Derivatives. XXII. 3-Amino-1-aryl SOV/79-29-2-29/71
Pyrazolines and Their Salicylal Derivatives

Cu^{+2} , Ni^{+2} , Co^{+2} , Zn^{+2} , Pb^{+2} , Be^{+2} . There are 3 figures
and 6 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State Uni-
versity)

SUBMITTED: December 16, 1957

Card 3/3

Konnov, Yu. V.

1989,
201/11-20-2-12/18

AUTHOR: Shemyakin, M. M.; Arsenov, Yu.; Kolesov, M. M.; Chumachenko, R. I.; Onopriuk, V. V.; Konnov, Yu. V.

TITLE: Investigation in the Field of Tetracyclones. VI. Carbonylation of Dimethone With Isocyanate

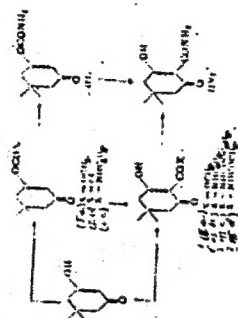
PERIODICAL: Zhurnal obshchey khimii, 1940, Vol. 20, No. 2, pp. 542-545 (USSR)

ABSTRACT: Carbonylation of dimethone with carbonic acid derivatives was done by one of the following variants. There are 5 references, 3 Soviet, 1 German, 1 U.S. The U.S. reference is: R. L. Frank, H. K. Hall, J. Am. Chem. Soc., 72, 1649, (1950).

ASSOCIATION: Institute of Organic Chemistry, Academy of Sciences, USSR (Institut organicheskoy khimii Akademii nauk SSSR)

SUBMITTED: February 25, 1959

Card 1/3



Card 2/3

Some Properties of Obtained Products

No	Starting material	Obtained product	Yield in %	bp/mm Hg	n_D^{20}
1	Ms-oxide of dimethone (I) + dry ether + chloroformic acid	Ia	76	122/1	1.4784
2	I + phosgene	3-chloro-5,5-dimethyl-2-oxo-1-ene	70	75/1	1.4953
3	I + phenyl isocyanate + dimethylformamide	IIB	75	59-52	
4	I + carbethoxy cyanide	IIIc	94	59-55	
5	IIIa + NH_4OH + CH_3OH	IV	97		

Card 3/3

L 37208-66

EWT(m)/EWP(j)

JW/RM

ACC NR:

AP6014413

SOURCE CODE: UR/0062/66/000/004/0753/0755

AUTHOR: Novikov, S. S.; Ivanova, I. S.; Bogdanova, G. F.; Alekseyeva, T. A.; Konnova, Yu. V.

ORG: Institute of Organic Chemistry im. N. S. Zelinakiy Academy of Sciences SSSR (Institut organicheskoy khimii, Akademii nauk SSSR)

TITLE: Synthesis and certain chemical conversions of nitro- and nitrazadicarboxylic acids

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 4, 1966, 753-755

TOPIC TAGS: organic nitro compound, aliphatic carboxylic acid, chemical reaction, dissociation constant, heat resistance

ABSTRACT: γ -nitro- and γ -nitro- γ -methylpimelic acid were synthesized from methyl acrylate and nitromethane (nitroethane). The dihydrazides and the dichloroanhydrides were prepared. Introduction of the nitro groups in the γ -position of pimelic acids reduced their thermal stability. Dissociation constants determined by potentiometric titration showed that introduction of 1 or 2 nitro groups in the γ -position of pimelic acid increased acid strength. Acid strength increases in the following

Card 1/2

UDC: 542.91 547.232

L 37208-66

ACC NR: AP6014413

series: pimelic, γ -nitro- γ -methylpimelic, γ -nitropimelic, 3-nitrazapentane dicarboxylic acid-1,5, and γ , γ -dinitropimelic. Orig. art. has: 1 table and 2 equations.

SUB CODE: 07/ SUBM DATE: 25Aug65/ ORIG REF: 002/ OTH REF: 003

Card 2/2 mcp

IVANOVA (Korsakova), I.S.; KONKOVA, Yu.V.; NOVIKOV, S.S.

Addition of ethylenedinitrodiamine to nitroalkenes. Izv. AN SSSR.
Otd.khim.nauk no.5:920-921 My '62. (MIRA 15:6)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
(Ethylenediamine) (Olefins)

IVANOVA, I.S.; KONNOVA, Yu.V.; POLOVNIKOV, S.S.

Syntheses of methyl ester of α -nitrocrotonic acid. Izv. AN SSSR. Otd. khim.
nauk no.9:1677-1678 1962. (MIRA 15:10)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
(Chrotonic acid)

IVANOVA, I.S.; KONNOVA, Yu.V.; BULATOVA, N.M.; NOVIKOV, S.S.

Addition of 3,3,5,5-tetranitropiperidine to α, β -unsaturated compounds.
Izv. AN SSSR. Otd. khim. nauk no. 9: 1686-1688 S '62. (MIRA 15:10)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR.
(Piperidine) (Unsaturated compounds)

IVANOVA, I.I. KONNOVA, Yu.V.; NOVIKOV, S.S.

Addition of hem-dinitroalkanes to unsaturated nitro compounds.
Izv. AN SSSR. Otd. khim. nauk no. 11:2078-2079 N '62.

(MIRA 15:12)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR.
(Nitro compounds) (Unsaturated compounds)

KONNOVA, Z.S., mladshiy nauchnyy sotrudnik

Method for isolating pure cultures of *Vibrio fetus*. Veterinariia
41 no.7:101 J1 '64. (MIRA 18:11)

1. Vsesoyuznyy institut eksperimental'noy veterinarii.

VOLOS KOV, P.A., prof.; KONNOVA, Z.S., mladshiy nauchnyy sotrudnik

Methods for isolating pure cultures of *Vibrio fetus*. Veterinariia
41 no.1:78 Ja '65. (MIRA 18:2)

1. Vsesoyuznyy institut eksperimental'noy veterinarii.

BEREZOV, Yu.Ye.; POTEMKINA, Ye.V.; MILONOV, B.V.; FRIDMAN, E.G.; KONOBEVTSEV,
O.F.

Possible surgical therapy of gastric stump tumors; preliminary
report. Grud. Khir. 3 no.2:77-83 '61. (MIRA 14:4)
(STOMACH—TUMORS)

L2650

S/062/62/000/011/015/021
B117/B101

11.1260

AUTHORS: Ivanova, I. S., Konnova, Yu. V., and Novikov, S. S.
TITLE: Addition of gem-dinitroalkanes to unsaturated nitro-compounds
PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 11, 1962, 2078-2079

TEXT: The nucleophilic addition of 1,1-dinitropropane, 1,1-dinitrobutane to β,β,β -trinitroethyl acrylate was examined in order to ascertain the reactivity of the double bond in acryl esters of nitro-alcohols. The reaction at room temperature in methanol and in the presence of catalytic amounts of sodium methylate resulted in the following compounds: (1) The 2,2,2-trinitroethyl ester of γ,γ -dinitrocaproic acid was obtained from 1,1-dinitropropane and 2,2,2-trinitroethyl acrylate; m.p. 53-54°C; yield 35.1%; (2) the 2,2,2-trinitroethyl ester of γ,γ -dinitroenanthic acid was obtained from 1,1-dinitrobutane and 2,2,2-trinitroethyl acrylate; m.p. 69-70°C, yield 17.3%. For comparison, the same gem-dinitroalkanes were added to 1-nitroalk-1-enes, whereby the following compounds were obtained for the first time: (1) 1,3,3-trinitro-2-methyl pentane,

Card 1/2

Addition of gem-dinitroalkanes...

S/062/62/000/011/015/021
B117/B101

b.p. 109-110.5°C (1 mm Hg), n_D^{20} 1.4727, from 1,1-dinitropropane and 1-nitropropene-1 in a yield of 49.2%; (2) 1,3,3-trinitro-2-ethyl pentane, b.p. 130-130.2°C (2 mm Hg), n_D^{20} 1.4764, from 1,1-dinitropropane and 1-nitrobutene-1 in a yield of 75%; (3) 1,3,3-trinitro-2-n-propyl pentane, b.p. 122-123°C (1 mm Hg), n_D^{20} 1.4750, from 1,1-dinitropropane and 1-nitropentene-1 in a yield of 81.1%. The yields of the adducts obtained indicate that the double bonds in nitroalkenes are more reactive than the double bond in the esters of unsaturated acids and nitro-alcohols. ✓

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N.D.Zelinskiy of the Academy of Sciences USSR)

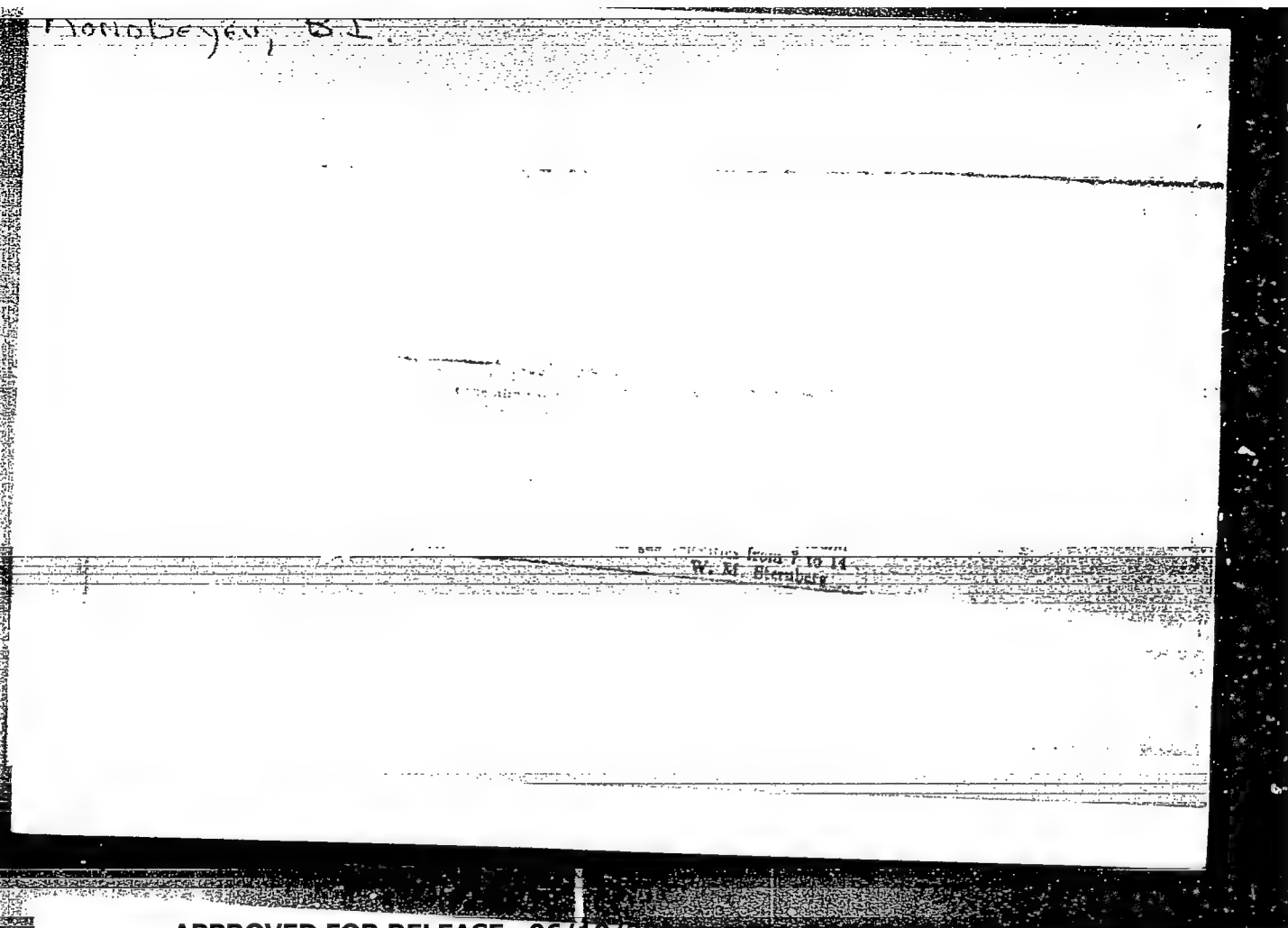
SUBMITTED: June 13, 1962

Card 2/2

CHIKLEYEV, S.; PAVLOVSKIY, M. (Kemerovskaya obl.); BOCHKOV, A.; KHARITONOV, I.; ZOLOTENKOV, V. (Yakutskaya ASSR); KONOBEYEV, A. (Bazarnoc-Karabulanskiy rayon, Saratovskaya obl.); VOLKOV, I.; BESEDIN, S. (Omsk); NOVIKOV, P.; GRINEV, V.; SOLOPENKOV, P.; ALEKSEYEV, K.; TOLKOV, I. (Rostovskaya obl.); KOSTENKO, P.; NOVIKOV, A., instruktor profilaktiki (Shumerlya, Chuvashskaya ASSR)

Reader's letters. Pozh. delo 9 no.11:30-31 N '63.

(MIRA 17:1)
1. Nachal'nik pozharnoy okhrany Klinskogo kombinata, Klin, Moskovskaya obl. (for Chikleyev). 2. Vneshtatnyy pozharnyy inspektor, predsedatel' Simferopol'skogo rayonnogo komiteta Dobrovol'nogo obshchestva sodeystviya armii, aviatsii i flotu (for Alekseyev). 3. Nachal'nik otдела Gosudarstvennogo pozharnogo nadzora, Sverdlovsk (for Kostenko).



Mass Exchange in Thin Liquid Films

20-4-36/52

hardly soluble gases in a filmy ("plenochnyy") current only depends on the conditions of the formation of waves, especially on the length of the waves λ and on their amplitude ("amplituda"). The wave length was experimentally stated means of 2 methods: 1) by direct light absorption of the liquid current in the tube, and 2) by light absorptions from the oscillograph. In this last case the flowing liquid film connected a circuit that included a source of current and a constant resistance of 50 000 ohms. The alternating component ("peremennaya sostavlyayushchaya") of the voltage that had arisen because of the changes of the thickness of the liquid layer, was transferred to the entrance of the oscillograph by the constant resistance. Table 1 shows the results of the experimental determinations of the wave length. Two equations, for rising and for falling liquids, are given. The first is exact enough as the correspondance of the results obtained by experiments to those obtained by calculation is satisfactory. For the determination of the amplitude ("amplituda") of the wave profile the electric resistance of the liquid film, dependent on its surface curvature, was used. Figure 3 shows the results of the measuring of the amplitude dependent on the gas speed in

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Mass Exchange in Thin Liquid Films

"APPROVED FOR RELEASE: 06/19/2000

CIA-RDP86-00513R000824310012-

20-4-36/52

rising and falling liquid current. In the first case the amplitude varies from 0,86 to 0,48, in the last case it is constant and amounts to 0,46. With both directions of the current it is independent of the current speed. Figure 4A shows experimental results on the dependence of the absorption coefficients of CO_2 by water on the wave length and on the amplitude of the rising and falling current. The coefficients of the mass exchange are dependent on the wave length and the amplitude. The data on the mass exchange can be placed satisfactorily within a curve if it is assumed that the mass exchange coefficients are proportional to the square of the amplitudes with any (fixed) value of the wave length. Finally the possibilities of calculating the CO_2 absorption coefficient by water, the wave length, and the thickness of the liquid film, are given. There are 4 figures, 1 table, and 11 references, 9 of which are Slavic.

Card 3/4

Mass Exchange in Thin Liquid Films

20-4-36/52

ASSOCIATION: Scientific Institute for Physical-Chemical Research
imeni L. Ya. Karpov (Nauchno-issledovatel'skiy fiziko-khimicheskiy
institut im. L. Ya. Karpova).

SUBMITTED: July 3, 1957

AVAILABLE: Library of Congress

Card 4/4

KONCHENOV, B.I., Cand Chem Sci—(diss) "Hydrodynamics and mass-ex-
change in films of a liquid ^{under gas} ~~at high~~ ^{ss.} ~~velocity of gas~~" Mos, 1958.

10 pp (Min of Chemical Industry USSR. Order of Labor Red Banner Sci
Res Phys-Chem Inst im L.Ya. Karpov), 110 copies (KL,22-58,102)

- 21 -

KOLODNYI, L.I., kand.khim.nauk; MAKUSOV, V.A., kand.khim.nauk;
ZHAVORONKOV, H.M.

Film absorption in a high speed gas flow. Khim. prom. no.7:475-
481 J1 '61. (MIRA 14:7)

1. Chlen-korrespondent AN SSSR (for Zhavoronkov).
(Absorption)

MONGAYT, I.L.; KONOBEYEV, S.I.

Sewage from plants producing synthetic alcohol by pyrolysis. Vod.
i san. tekhn. no.3:20-22 Je '55. (MIRA 8:12)
(Factory and trade waste) (Wood--Distillation)

Submitted : No date

KONOBAYEV, Yu.V.

Effect of reabsorption on damping of the phosphorescence of
molecules in a plane-parallel layer. Opt. i spektr. 15
no.3:375-380 S. '63. (MIRA 16:10)

AUTHORS: Agranovich, V.M. and Konobeyev, Yu.V.

SOV/51-6-2-22/39

TITLE: On the Free-Path Length of an Exciton in a Molecular Crystal (O
dline svobodnogo probega eksitona v molekulyarnom kristalle)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 2, pp 242-245 (USSR)

ABSTRACT: The authors calculated theoretically the mean free path of a "non-localized" (free) exciton interacting with the acoustical branch of lattice vibrations. For the cubic lattice, when the interaction with only the nearest neighbours is considered and the effective exciton mass approximation is used, the authors obtained a value of 20 Å for the mean free path of an exciton in a molecular crystal under the conditions of thermal equilibrium at 300°K. The diffusion coefficient of excitons was found to be of the order of 1 cm²/sec. This value is one order higher than the values obtained by the direct measurements (Refs 1-3). This difference between the observed and calculated

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On the Free-Path Length of an Exciton in a Molecular Crystal

SOV/51-6-2-22/39

diffusion coefficients may be due to either the importance of the "localized" excitons, or due to lattice defects distributed in such a way that the distances between them are less than the calculated value of the exciton mean free path. There are 8 references, 5 of which are Soviet, 1 Czech and 2 English.

SUBMITTED: June 25, 1958

Card 2/2

24(4), 24(6)

SOV/51-6-5-15/34

AUTHORS: Agranovich, V.M. and Konobeyev, Yu.V.

TITLE: The Effect of Re-Absorption on the Yield and Duration of Luminescence of Molecular Crystals. I. (Vliyanie reabsorbtsii na vykhod i dlitel'nost' lyuminestsentsii molekulyarnykh kristallov. I)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 5, pp 648-658 (USSR)

ABSTRACT: In previous work on phenomenological theory of excitons in molecular crystals (Refs 1-3) it was implicitly assumed that reflection of luminescencelight from crystal surfaces can be neglected. Experimental evidence (Ref 4) shows that if this reflection is neglected the luminescence curves may be affected in some cases. For this reason the authors discuss here a kinetic equation which describes the distribution of excitons in a molecular crystal and which allows for internal reflection of luminescent light from crystal surfaces. For the case when the exciton diffusion coefficient is sufficiently small, exact formulae are obtained which give the quantum yield and duration of luminescence of crystals in the form of plane-parallel plates of any thickness. From the formulae which give the quantum yield the luminescence spectra can be deduced. The paper is entirely theoretical. There are 2 tables and 8 Soviet references.

Card 1/1

SUBMITTED: May 12, 1958

247600 (1043, 1155, 1158)

S/181/61/003/001/011/042
B006/B056

AUTHORS: Agranovich, V. M., Konobeyev, Yu. V.

TITLE: Theory of the thermal conductivity of dielectrics below the Debye temperature

PERIODICAL: Fizika tverdogo tela, v. 3, no. 1, 1961, 97-99

TEXT: The theory of the thermal conductivity of dielectrics with $T \ll \theta$ shows unsatisfactory agreement with the experiment. Especially the expression derived by Klemens for the coefficient of thermal conductivity κ is not clear in some respects. The present paper deals in detail with studies by Ziman (Ref. 3), and it is shown in what way an expression for κ that shows better agreement with the experiments may be found. Ziman used a variational principle to solve the Boltzmann equation

$$\text{Lg}(\vec{f}, s) = - \frac{N_0(N_0+1)}{\int} [g(\vec{f}, s) + \partial N / \partial t] = -v_{fsx} \frac{\hbar \omega}{kT^2} N_0(N_0+1) dT/dx = X \text{ by means}$$

of the function $N(\vec{f}, s) = N_0(\omega) + g(\vec{f}, s)N_0(N_0+1)$. $N_0(\omega) = (\exp \frac{\hbar \omega}{kT} - 1)^{-1}$,

$\vec{v}_{fs} = \partial \omega(\vec{f}, s) / \partial \vec{f}$; s characterizes the polarization; \vec{f} is the quasi-momentum.

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05270

Theory of the thermal...

S/181/61/003/001/011/042
B006/B056

This Boltzmann equation may be solved by the method of least squares, i.e., by finding the minimum of the functional

$J = \sum_{f,s} (Lg - X)^2 \equiv \langle Lg - X, Lg - X \rangle$; one obtains, like Ziman, $g = Cf_x$ as a trial function, where C is a constant. The following expression is then obtained for κ :

$$\chi = \frac{12.99 \frac{k^4}{\pi^2} \left(\frac{T}{\hbar}\right)^3 \int_0^\infty \frac{x^4 e^{-x} dx}{(\epsilon^2 - 1) \epsilon_0 \left(\frac{kT}{\hbar} x\right)} \int_0^\infty \frac{x^4 e^{-x} dx}{(\epsilon^2 - 1) \epsilon_0 \left(\frac{kT}{\hbar} x\right)} \quad (3);$$

the relaxation length, l_0 , is defined by $1/l_0 = \sum 1/l_\alpha$, where l is the mean free path corresponding to the α -th process. If one confines oneself to four processes which are assumed to play the main part in dielectrics, one obtains

$1/(l_0 kT/\hbar) = 1/L + A\epsilon(T/\theta)^4 x^4/a + S(T/\theta)^2 \exp(-\theta/2T) - x^2/a + B(T/\theta)^2 x^2/a$,
where $x = \hbar\omega/kT$; L is a length of the order of the specimen dimension;
 ϵ is the impurity concentration in the crystal; A and B are constants

Card 2/4

89278

S/181/61/003/001/011/042
B006/B056

Theory of the thermal...

which depend on the nature of the impurities and on the grain size; S is a constant related to transfer processes; V is the mean velocity of sound; and a is the lattice constant. For that temperature range in which phonon scattering by impurities is the most probable process, the expression for

κ is reduced to: $\kappa = \frac{a}{2\pi^2} \frac{k^4 0^4}{h^3 v^2} \frac{0.0383}{\Delta L} \frac{1}{T}$ (5); this is 2.3 times the value obtained by Ziman. If the impurities are isotopes, then

$\Delta L = (6\pi^2)^{1/3} \frac{9\pi}{\sqrt{3}} \frac{\sum (M_i - \bar{M})^2 c_i}{\bar{M}^2}$, where c_i is the concentration of the various

isotopes. Eq. (5) shows better agreement with the experiment than that by Ziman. For Ge with known isotopic composition, one obtains experimentally at 500K: $\kappa = 12$ v/cm-deg,

according to Ziman 3.1 v/cm-deg,

according to (5) 7.1 v/cm-deg, and

according to Klemens 166 v/cm-deg.

I. Ya. Pomeranchuk is mentioned. There are 6 references: 1 Soviet-bloc and 5 non-Soviet-bloc.

Card 3/4

89278

20108

S/181/61/003/002/006/050
B102/B204

9.4300 (and 1035, 1043)

AUTHORS: Agranovich, V. M. and Konobeyev, Yu. V.

TITLE: The theory of the edges of the exciton absorption bands

PERIODICAL: Fizika tverdogo tela, v. 3, no. 2, 1961, 360-369

TEXT: If one considers the delayed interaction of electrons with one another in a crystal field, new elementary excitations occur already in zero-th approximation besides the excitons and transversal photons, which may be considered to be a "mixture" of these two states; according to Hopfield, they are called polaritons. They are excited by light waves incident upon the crystal from outside, and the attenuation of light when passing through the crystal is due to interaction between polaritons and lattice vibrations. Consideration of the delay may be of importance for such exciton absorption bands as correspond to greater oscillator forces. In this case, an additional absorption may occur also with positive effective exciton masses at frequencies lower than the limit frequency of the exciton branch; at low temperatures, this additional absorption determines the shape of the long-wave edge of the exciton absorption bands.

Card 1/9

20108

The theory of the edges of the...

S/181/61/003/002/006/050
B102/B204

This is here theoretically investigated by the example of a molecular crystal. For reasons of simplicity, only acoustic lattice vibrations are taken into account. First, the suitable formulation of the electron-phonon Hamiltonian in consideration of retardation is discussed. As end form

$$\hat{H} = \hat{H}_0 + \hat{H}_{p.m.} + \hat{H}_{m.} \equiv V_0 + \sum_{k,p} \mathcal{E}_p(k) \xi_{pk}^+ \xi_{pk} +$$

$$+ \sum_{\substack{m, m_1 \\ x_1, x_2}} A_{m, m_1}^{x, x_1} u_{m, x_1} u_{m, x_2} + \frac{1}{2} \sum_m \frac{M \dot{u}_m^2}{2} + \sum_{\substack{k, p, k_1, p_1 \\ m, x}} B(k, p, k_1, p_1; m, x) \xi_{kp}^+ \xi_{k_1 p_1} u_{m, x}. \quad (9)$$

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$$B(k, p, k_1, p_1; m, x) = \frac{u_k^*(p) u_{k_1}(p_1)}{N} e^{i(m(k_1 - k) - \hbar)[\Phi^*(k_1) - \Phi^*(k)]}. \quad (10)$$

is obtained, where ξ_{qk}^+ and ξ_{qk}^- are the Bose creation and annihilation operators of the polariton (qk), $\mathcal{E}_q(k)$ is the energy of the polariton

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branch q with the wave vector \vec{k} , $\Phi^x(\vec{k}) = \sum_{\vec{m}_1} \Phi_{\vec{m}_1}^x e^{ik(\vec{m}_1 - \vec{m})}$, u_{sx} is the

x -th projection of the displacement vector of the s -th molecule from equilibrium. In the following, the spectrum of the elementary excitations in the concrete case of a crystal with one molecule per elementary cell is investigated. It is assumed that a non-degenerate electron transition in an isolated molecule is allowed in dipole approximation. If here retardation is not taken into account, the lowest elementary excitations are two coinciding branches of transverse photons (polarization $j = 1, 2$) and one exciton branch (polarization in the direction of the dipole moment of the transition in the molecule). For the polariton spectrum one obtains

$$\epsilon_{1,2}^2(q) = \frac{E^2(q) + \frac{c^2 q^2 + \omega_0^2 F \sin^2 \varphi}{\epsilon_0}}{2} \pm \frac{1}{2} \sqrt{\left(E^2 + \frac{c^2 q^2 + F \omega_0^2 \sin^2 \varphi}{\epsilon_0}\right)^2 - \frac{4c^2 q^2 E^2(q)}{\epsilon_0^2}} \quad (12)$$

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The displacement vector is given by

$$u_k(\rho) = T(k) \sqrt{\frac{kc[E(k) + \delta_p(k)]^2}{\delta_p(k)[4kcE(k)|T(k)|^2 + (E^2(k) - \delta_p^2(k))^2]}}, \quad (13)$$

$$T(k) = i \sqrt{\frac{2\pi N}{kcV}} |P_{0f}| \sin \varphi(s) E(k). \quad (14)$$

$E(\vec{q})$ is the exciton energy, F the oscillator force, N/V is the number of elementary cells per unit of volume, P_{0f} - the dipole moment of the transition into an isolated molecule. In the following, the contour of the absorption bands is calculated, using the Green temperature functions for polaritons and phonons

$$G(\rho k x_0, \rho' k' x'_0) = \frac{i}{\langle S \rangle} \langle T \{ \xi_{\rho k}(x_0) \xi_{\rho' k'}^+(x'_0) S \} \rangle, \quad (16)$$

$$D_{\rho s}(m x_0, m' x'_0) = -\frac{i}{\langle S \rangle} \langle T \{ u_{m s}(x_0) u_{m' s'}^+(x'_0) S \} \rangle, \quad (17)$$

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$$S = T e^{\sum_m \int dx_0 J_m^A(x_0) u_{m s}(x_0)}$$

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After a Fourier transformation,

$$G(\rho, \rho', k; E) = G^{(0)}(\rho, k, E) \delta_{\rho\rho'} - (2\pi)^3 G^{(0)}(\rho, k, E) \sum_{\rho''} M_{\rho\rho''}(k, E) \times \\ \times G(\rho'', \rho', k; E), \quad (19)$$

где в первом исчезающем приближении теории возмущений

$$M_{\rho\rho''}(k, E) = -\frac{i}{\sqrt{N}} \sum_{\rho_1, k_1} \Phi^*(k_1, k) \Phi^{\beta}(k, k_1) |u_{k_1}(\rho_1)|^2 \times \\ \times u_k^*(\rho) u_k(\rho'') \int dE' G^{(0)}(k_1, \rho_1; E') D_{\beta\alpha}^{(0)}(k-k_1, E'-E). \quad (20)$$

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$$\Phi^*(k, k_1) = \Phi^*(k) - \Phi^*(k_1).$$

is obtained for the Dyson equation, where (20) holds in first perturbation-theoretical approximation. Thus, finally

$$M_{\rho\rho''}(k, E) = -\frac{1}{4\pi MN} \sum_{\rho, k_1, j} \frac{(\Phi(k_1, k) e_j) (\Phi(k_1, k) e_j^*)}{\omega_j(k-k_1)} \times \\ \times \left[\frac{n(\omega_j(k-k_1))}{E - \delta_{\rho, (k_1)} + \omega_j(k_1-k)} + \frac{1+n(\omega_j(k-k_1))}{E - \delta_{\rho, (k_1)} - \omega_j(k-k_1)} \right] \times \\ \times |u_{k_1}(\rho_1)|^2 u_k^*(\rho) u_k(\rho''). \quad (24)$$

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is obtained for $M_{pp}(\vec{k}, E)$. The fact that the matrix M has off-diagonal elements, leads to a certain deformation of the polariton spectrum; in the approximation studied here, this deformation is due to virtual phonon exchange of polaritons belonging to different branches. These processes may be, above all, of essential importance if \vec{k} has nearly the same direction as the polarization of the transition in the molecule ($\varphi(\vec{s})$ being small with respect to the energy gap). Further, only the case of large $\varphi(\vec{s})$ is investigated, where the off-diagonal terms remain insignificant. For the purpose of determining the imaginary part of polaron energy with phonons, which is due to interaction, the imaginary part of the mass operator is first determined. By approximation, the following is obtained:

$$\begin{aligned} \text{Im } M_{pp}(\vec{k}, E) = & -\frac{id^3}{4(2\pi)^3 M} \sum_{p, j} \int d\vec{k}_1 \frac{|\varphi_j \Phi(\vec{k}, \vec{k}_1)|^2}{\omega_j(\vec{k} - \vec{k}_1)} \times \\ & \times (n(\omega_j(\vec{k}_1 - \vec{k})) \delta(E_p(\vec{k}) - \varepsilon_p(\vec{k}_1) + \omega_j(\vec{k}_1 - \vec{k})) + \\ & + [1 + n(\omega_j(\vec{k} - \vec{k}_1))] \delta(E_p(\vec{k}) - \varepsilon_p(\vec{k}_1) - \omega_j(\vec{k} - \vec{k}_1))) \times \\ & \times |u_p(\vec{k})|^2 |u_p(\vec{k}_1)|^2. \end{aligned} \quad (25)$$

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$$\left. \begin{aligned} \operatorname{Re} E_p(\mathbf{k}) &= \mathcal{E}_p(\mathbf{k}) - 2\pi \operatorname{Re} M_p(\mathbf{k}, E_p(\mathbf{k})), \\ |\operatorname{Im} E_p(\mathbf{k})| &= |2\pi \operatorname{Im} M_p(\mathbf{k}, E_p(\mathbf{k}))|. \end{aligned} \right\} \quad (26)$$

and, in Debye approximation,

$$\operatorname{Im} E_1(\mathbf{k}) = \frac{d^3}{16\pi^2 M} \int d\mathbf{f} \frac{|\Phi(\mathbf{k}, \mathbf{k}-\mathbf{f})|^2}{\omega(\mathbf{f})} \{ n(\omega(\mathbf{f})) \delta(\mathcal{E}_1(\mathbf{k}) - \mathcal{E}_1(\mathbf{k}-\mathbf{f}) + \omega(\mathbf{f})) + \\ + [1 + n(\omega(\mathbf{f}))] \delta(\mathcal{E}_1(\mathbf{k}) - \mathcal{E}_1(\mathbf{k}-\mathbf{f}) - \omega(\mathbf{f})) \}. \quad (27)$$

Herefrom it follows that also at very low temperatures, if $n(\omega) \simeq 0$ in the energy range of $\mathcal{E}_1(\mathbf{k}) < E_{\text{exc}}(0)$, $\operatorname{Im} E_1(\mathbf{k})$ is non-vanishing, and therefore polariton attenuation occurs. At $T = 0$

$$\operatorname{Im} E_1(\mathbf{k})|_{T=0} = \frac{9c^4 F^2}{16\pi^2 M d^3 \mu^2 \omega_f^2} \int \frac{d\mathbf{f}}{\omega(\mathbf{f})} (f^2 + 3f_z^2) \times \\ \times \delta(\mathcal{E}_1(\mathbf{k}) - \mathcal{E}_1(\mathbf{k}-\mathbf{f}) - \omega(\mathbf{f})). \quad (30)$$

holds, which may be represented approximately by

$$\operatorname{Im} E_1(\mathbf{k})|_{T=0} \simeq \frac{9\gamma_1 F^2 e^4}{32\pi M d^3 \omega_f^2 k^3 \mu^2} \left(\frac{\omega_0^2 F E_{\text{exc}}(0)}{2c^2} \right)^2 \times$$

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$$\times \left[\frac{A^2 + 2}{1 + A} - 2 \ln(1 + A) \right], \quad (33)$$

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$$A = \gamma_2 \frac{2\pi k^2 c^2}{\omega_0^2 F E_{\text{exc}}(0)} \quad (34)$$

For the absorption coefficient,

$$\kappa \equiv \frac{\text{Im} E_1(k)|_{T=0}}{v_{\text{rp}}(k)} = \frac{9\gamma_1 F^2 \omega_0^2 E_{\text{exc}}(0) e^4}{128\pi M \mu^2 d^3 s^4 c^2 \omega_0^2} \left(1 + \frac{k^2 c^2}{M_{\text{exc}}(s) \omega_0^2 F E_{\text{exc}}(0)} \right) \times$$

$$\times \left[\frac{A^2 + 2A}{1 + A} - 2 \ln(1 + A) \right]. \quad (36)$$

$k, \frac{1}{\text{cm}}$	A	Δ, m	$\kappa, \frac{1}{\text{cm}}$
$5 \cdot 10^5$	10^{-3}	0.4	$5 \cdot 10^{-3}$
10^6	$8 \cdot 10^{-3}$	0.1	2.5
$2 \cdot 10^6$	$64 \cdot 10^{-3}$	0.025	$1.2 \cdot 10^3$
$4 \cdot 10^6$	0.51	0.006	$6 \cdot 10^5$
$5 \cdot 10^6$	1	0.004	$\approx 2 \cdot 10^6$
$k = k_0 \approx 10^7$	8	0	$\approx 10^7$

is obtained. Calculated for benzene crystals, the values given in the table result. The results obtained show that here the long-wave absorption edge due to retardation of the range $100 - 200 \text{ cm}^{-1}$ is extended below the exciton energy limit $E_{\text{exc}}(0)$. At sufficiently low temperature, this effect remains essential and may in favorable cases produce an effect upon the exciton absorption line widths at low temperatures. A.S.Davydov, S. I. Pekar, and S. V. Tyablikov are mentioned. There are 1 figure,

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AGRANOVICH, V.M.; KONOBEYEV, Yu.V.

Reabsorption in crystals of finite thickness. Part 2.
Opt. i spektr. 11 no.3:369-384 S '61. (MIRA 44:9)
(Crystals—Optical properties)

AGRANOVICH, V.M.; KONOBEYEV, Yu.V.

Effect of the self-absorption of light on the spectral dependence
of the photoconductivity of molecular crystals. Opt.i spektr.
11 no.4:498-503 0 '61. (MIRA 14:10)
(Crystals--Spectra) (Photoconductivity)

KONOBEYEV, Yu.V.

Self-absorption in crystals of finite thickness. Part 3. Opt.1
spektr. 11 no.4:504-512 0 '61. (MIRA 14:10)
(Crystals---Optical properties)

KONOBEYEV, YU. V.

Dissertation defended for the degree of Candidate of Physicomathematical Sciences at the Physics Institute imeni P. N. Lebedev in 1962:

"Theory of the Migration of Electronic Excitation in Molecular Crystals."

Vest. Akad. Nauk SSSR. No. 4, Moscow, 1963, pages 119-145

S/181/62/004/012/039/052
B125/B102

AUTHOR: Konobeyev, Yu. V.

TITLE: The effect of defects on the exciton luminescence of molecular crystals

PERIODICAL: Fizika tverdogo tela, v. 4, no. 12, 1962, 3634-3639

TEXT: The probability for an exciton to be converted into light (or the scattering of a polariton from the lattice defect) is calculated by the more precise and more conclusive microscopic theory developed by V. M. Arganovich (ZhETF, 37, 430, 1959) for molecular crystals of arbitrary symmetry. The macroscopic defects involved in earlier calculations of this probability based on the phenomenological theory may be absent in sufficiently perfect crystals. A molecule contained in an arbitrary site characterized by the lattice vector is assumed to be replaced by an impurity molecule, including also the case in which the molecule is absent.

The Hamiltonian $\hat{H} = \hat{H}_0 + \hat{H}_1$ of such a molecular crystal consists of the Hamiltonian $\hat{H}_0 = \sum_{\vec{R}, q} E_q(\vec{R}) \left\{ \begin{matrix} \dagger \\ \bar{q} \vec{k} \end{matrix} \right\} \left\{ \begin{matrix} \dagger \\ q \vec{k} \end{matrix} \right\}$ of the ideal molecular crystal and

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of the addition \hat{H}_1 for the distortion. \hat{H}_1 can easily be derived from the results obtained by V. M. Arganovich and be reduced to the form

$$\begin{aligned} \hat{H}_1 = \frac{1}{N} \sum_{\mathbf{s}, \mathbf{s}'} \sum_{\mathbf{k}, \mathbf{k}'} g_{\mathbf{s}}(\mathbf{k}', \mathbf{k}) [u_{\mathbf{k}}^+(\rho') u_{\mathbf{k}'}(\rho'') \xi_{\mathbf{s}, \mathbf{k}}^+ \xi_{\mathbf{s}', \mathbf{k}'} + \\ + u_{\mathbf{k}}^+(\rho') v_{\mathbf{k}'}^+(\rho'') \xi_{\mathbf{s}, \mathbf{k}}^+ \xi_{\mathbf{s}', \mathbf{k}'} + v_{\mathbf{k}}(\rho) u_{\mathbf{k}'}(\rho'') \xi_{\mathbf{s}, \mathbf{k}} \xi_{\mathbf{s}', \mathbf{k}'} + \\ + v_{\mathbf{k}}(\rho) v_{\mathbf{k}'}^+(\rho'') \xi_{\mathbf{s}, \mathbf{k}} \xi_{\mathbf{s}', \mathbf{k}'}^+], \end{aligned} \quad (7)$$

$$\begin{aligned} g_{\mathbf{s}}(\mathbf{k}', \mathbf{k}) = e^{i(\mathbf{k}' - \mathbf{k}) \cdot \mathbf{r}_{\mathbf{s}}} [\Delta_{\mathbf{s}} + \bar{V}(0f, f0; -\mathbf{k}') - \\ - V(0f, f0; -\mathbf{k}'') + \bar{V}(0f, f0; \mathbf{k}') - V(0f, f0; \mathbf{k}'') + \bar{V}(f0, f0; \mathbf{k}' - \mathbf{k}') - \\ - \bar{V}(00, 00; \mathbf{k}' - \mathbf{k}') - V(0f, 0f; \mathbf{k}' - \mathbf{k}') + V(00, 00; \mathbf{k}' - \mathbf{k}')], \end{aligned} \quad (8)$$

by a linear transformation. $B_{\mathbf{s}f}^+$ and $B_{\mathbf{s}f}$ are the Bose production and annihilation operators of the f -th electron excitation of the molecule at the site \mathbf{s} . Products of the type $B_{\mathbf{s}f}^+ B_{\mathbf{s}_1 f}^+$ and $B_{\mathbf{s}f}^+ B_{\mathbf{s}_1 f}$ are neglected

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in the exciton part of the total Hamiltonian. N is the total number of elementary cells within the crystal. The functions $u_{\vec{k}}(s)$ and $v_{\vec{k}}(q)$ follow from a system of equations adopted from the afore-mentioned previous work. Further, the equation

$$V(ff, f'f'; k) = \sum_s e^{ik \cdot r_s} V_{ss}(ff, f'f'). \quad (9)$$

holds. By integrating with the wave vector \vec{k} of the branch q_1 over the probability $W_{\vec{k}_1 \rightarrow \vec{k}_2}$ for the scattering of a polariton from an impurity with transition to the state \vec{k}_2 ,

$$W = |V(k_1, k_2)|^2 \frac{k_1^2 V}{\pi \left| \frac{\partial E(k)}{\partial k} \right|_{k=k_1}}. \quad (12)$$

follows for the total transition probability of a polariton from the state

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A to the state B. This formula leads to

$$W = \frac{|s_m(k_1, k_2)|^2}{\pi N} \frac{M_{exc} d^3 k_0^3}{k_1(k_1^2 - k_0^2)} \frac{1}{1 + \frac{E(0) \cdot k_1^2}{M_{exc} c^2 k_0^2}} \quad (21)$$

which applies, however, only to cubic crystals and to the largest terms. $M_{exc} = M_{exc} = |m_{exc}|$ is the effective exciton mass and d is the lattice constant. W is that portion of the imaginary section of the complex polariton energy which describes the damping of a polariton wave ($W \rightarrow \infty$ if $k_1 \rightarrow k_0$). With $d = 5 \text{ \AA}$, $M_{exc} = 10 \mu$ (μ is the electron mass)

$k_0 = 10^6 \text{ cm}^{-1}$, $E(0) = 2.5 \text{ eV}$, $g_m = 0.1 \text{ eV}$ and $k_1 = 1.5 k_0$; $k_1 = 3 k_0$ and $k_1 = 10 k_0$, the resulting for the probabilities are $W = 1.5 \cdot 10^{13}/N$;

$W = 3.5 \cdot 10^{11}/N$ and $W = 9 \cdot 10^8/N$. The numerical value of the total probability for the scattering of a polariton from a defect depends very strongly on the shape of the exciton band. The present considerations apply if the bottom of the exciton band under investigation is not too far away from the maximum of the polariton band. There is 1 figure.

SUBMITTED: July 16, 1962
Card 4/4

GALANIN, M.D.; KONOBEEV, Yu.V.; CHIZHIKOVA, Z.A.

Effect of reabsorption on the law of damping of the
luminescence of anthracene crystals. Opt. i spektr.
13 no.3:386-389 S '62. (MIRA 15:9)
(Anthracene crystals) (Luminescence)

L 18744-63 EWT(1)/BDS AFFTC/ASD/IJP(C)/SSD
ACCESSION NR: AT3002208 S/2941/63/001/000/0135/0147

AUTHOR: Konobeyev, Yu. V.

TITLE: Effect of exciton diffusion on kinetics of luminescence

SOURCE: Optika i spektroskopiya; sbornik statey. v. 1: Lyuminestsentsiya.
Moscow, Izd-vo AN SSSR, 1963, 135-147

TOPIC TAGS: migration, exciton, diffusion length, reabsorption

ABSTRACT: In crystal molecules the migration of the excitation energy of electrons can occur by either the mechanism of exciton diffusion (radiationless process) or the mechanism of reabsorption. Starting from integrodifferential kinetic equations describing exciton concentration distributions, the author develops expressions to describe exciton migrations in semiconducting crystals. The analysis is divided into stationary and nonstationary (exponentially time-dependent luminescence) cases, and in each case the complex integrodifferential equations are simplified and integrated in closed form for the limiting cases of weak and strong reabsorption. As an example a detailed calculation is given for the anthracene

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L 18744-63
ACCESSION NR: . AT3002208

molecule. "The author expresses his gratitude to V. M. Agranovich for his evaluation of this work." Orig. art. has; 48 equations.

ASSOCIATION: none

SUBMITTED: 05Apr62

DATE ACQ: 19May63

ENCL: 00

SUB CODE: PH

NO REF SOV: 007

OTHER: 001

Card 2/2

L 13035-63 EPF(c)/EWT(1)/EWG(k)/EWT(m)/BDS AFFTC/ASD/ESD-3

Pr-4/Pz-4 RM/WW/AT/IJP(C)

ACCESSION NR: AP3000616

S/0181/63/005/005/1373/1376

70

AUTHOR: Agranovich, V. M.; Konobeyev, Yu. V.

TITLE: Diffusion of excitons in molecular crystals

SOURCE: Fizika tverdogo tela, v. 5, no. 5, 1963, 1373-1376

TOPIC TAGS: exciton, scattering, diffusion, naphthalene, anthracene, electron, electron excitation, lattice defect, thermal defect, exciton scattering, exciton diffusion, energy transfer, molecular crystal

ABSTRACT: The authors take the experimental data of A. A. Kazzaz and A. B. Zehlan (Phys. Rev., 124, 90, 1961) and analyze them to study the energy transfer of electron excitation from its base substance to an impurity in crystals of naphthalene containing low concentrations of anthracene admixtures. They show that the experimental data obtained by Kazzaz and Zehlan confirm the view that this transfer of energy is effected by "free" excitons, the mean free path of which is determined by the temperature and by scattering through collision either with phonons or with thermal defects in the crystal lattice. Orig. art. has: 4 formulas.

ASSOCIATION: none

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AGRANOVICH, V.M.; KONOBYEV, Yu.V.

Theory of dielectric permeability of crystals. Fiz. tver tela 5
no.9:2544-2555 S '63. (MIRA 16:10)

S/0181/64/006/003/0831/0841

ACCESSION NR: AP4019846

AUTHORS: Agranovich, V. M.; Konobeyev, Yu. V.

TITLE: The theory of exciton phonon interaction in molecular crystals

SOURCE: Fizika tverdogo tela, v. 6, no. 3, 1964, 831-841

TOPIC TAGS: exciton, exciton phonon interaction, molecular crystal, Green function, electron phonon interaction, dipole dipole interaction, crystal lattice

ABSTRACT: The authors have used Green's function to investigate the effect of electron-phonon interaction on the spectra of excitons and phonons in molecular crystals. They have assumed that the energy of a crystal is manifested chiefly in dipole-dipole interaction between molecules and that the interaction of excitons with intramolecular vibrations of the nuclei may be neglected. In employing this model of a molecular crystal, they have shown that exciton-phonon interaction may be considered a weak perturbation, not leading to any local deformation of the lattice and, consequently, not leading to the formation of localized excitons. It is concluded, within the framework of the model they have employed for molecular

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DUBOVSKIY, O.A.; KONOBEYEV, Yu.V.

Capture of free excitons by shallow traps in molecular crystals.
Fiz. tver. tela 6 no.9:2599-2609 S '64.

(MIRA 17:11)

L 12643-65 EWT(1)/T/EEC(b)-2 IJP(c)

ABSTRACT NR: AP4044927

S/0181/64/006/009/2599/2609

AUTHORS: Dubovskiy, O. A.; Konobeyev, Yu. V.

TITLE: Capture of free excitons by shallow traps in molecular crystals

SOURCE: Fizika tverdogo tela, v. 6, no. 9, 1964, 2599-2609

TOPIC TAGS: exciton phonon interaction, molecular crystal, electron capture, exciton capture, exciton band, spectrum shift, impurity

ABSTRACT: The investigation was stimulated to a considerable degree by the results of Propstl and Wolf (Zeits. fur Naturfors. v. 18a, 822) which no satisfactory theoretical explanation is given. Using the weak exciton-phonon coupling approximation, the authors calculate the probability for the capture of a free electron in a molecular crystal by a shallow local energy level lying below the bottom of the exciton band at a distance smaller than the energy

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L 12643-65

ACCESSION NR: AP4044927

of the Debye phonon. The purpose of this calculation is to show that the probabilities obtained by Propstl and Wolf for the capture of an excitation by an impurity which forms a shallow local level of this type can be satisfactorily explained by assuming that the energy is transferred by free excitons (coherent excitons). The situation considered in greatest detail is the one in which the replacement of the molecule of the host substance by the impurity molecule leads only to a shift in the spectral terms. It is shown that at sufficiently low temperatures the magnitude and temperature dependence of the capture probability of the free exciton by a molecule, followed by emission of a single acoustic phonon, is in good agreement with the known experimental data. For the case of the naphthalene crystal, the theoretical estimate for the quantities characterizing the probability is $1.2 \times 10^{11} \text{ sec}^{-1}$, whereas the experimental value is 5×10^{11} . "The authors thank V. M. Agranovich for discussions and valuable advice." The article has 42 formulae.

L 12643-65

ACCESSION NR: AP4044927

ASSOCIATION: None

SUBMITTED: 24Feb64

ENCL: 00

NR REF SOL: 007

OTHER: 003

L 25087-65 EWT(1)/EPA(s)-2/EEC(t) Pt-10/Pl-4 IJP(c) GG

ACCESSION NR: AP5003421

S/0181/65/007/001/0111/0117

AUTHORS: Agranovich, V. M.; Konobeyev, Yu. V.

TITLE: Theory of long-wave surface excitons in dielectrics

SOURCE: Fizika tverdogo tela, v. 7, no. 1, 1965, 111-117

TOPIC TAGS: exciton, dielectric, polarization, surface state, crystal boundary, crystal conductivity

ABSTRACT: In view of recent experiments performed on absorption lines connected with the excitation of surface excitons, the authors developed, within the framework of the macroscopic approach, a method which makes it possible to determine the polarization and the frequencies of long-wave exciton surface states. It is shown that these characteristics are determined completely by the analytic continuation of the dielectric tensor of the crystal into the region of complex wave vectors, and also in some cases by additional boundary

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ACCESSION NR: AP5003421

conditions, which must be used to take account of spatial dispersion. The case of surface excitons is considered in some detail for an isotropic medium that borders on vacuum. Two types of surface excitons are found in this case, one with nonzero electric vector, for which there is no need to take account of the spatial dispersion, and one type with zero electric vector and nonzero induction vector, which calls for the use of additional boundary conditions. The approach used is a natural development of the method described by one of the authors previously (Agranovich, with V. L. Ginzburg, UFN, v. 77, 663, 1962), for the investigation of volume excitons with account of spatial dispersion. The limitations of the microscopic approach to the problem are pointed out in the conclusion. "The authors thank V. L. Ginzburg for valuable advice." Orig. art. has: 12 formulas.

ASSOCIATION: None

Card

2/3

SWT(1)/T/SEC(b)-2 P1-4 IJP(c) 33
 NR: AP5006923 5/0181/65/007/003/0946/0947

Dubovskiy, O. A.; Konobayev, Yu. V.

Cross section for the scattering of a free exciton by an
 in a molecular crystal.

Fizika tverdogo tela, v. 7, no. 3, 1965, 946-947

exciton, molecular crystal, scattering cross section,
 level

Earlier calculations of the scattering cross section were
 for too rough assumptions or limited to a linear model. In
 the article the cross section is determined for the three-
 dimensional case, using a general expression obtained earlier (PFT
 1964, 1964) for the normalized amplitudes of the exciton
 of the lowest band in the presence of a lattice imperfection.
 Also made of a procedure developed by I. P. Lifshits (ZhETF
 v. 19, 293, 48) to obtain asymptotic expressions for the normalized
 amplitudes. The calculations show that the mean free path of the exci-
 quite small either when the impurity concentrations are

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ACC NR: AM5022447

Monograph

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Konobeyev, Yu. V.

Theory of electron-excitation energy migration in molecular crystals
(K teorii migratsii energii elektronogo возбуждениya v molekulyarnykh kristallakh) Moscow, 1965. 114 p. illus., biblio. (At head of title: Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii SSSR) Dissertation submitted for the degree of candidate of physical and mathematical sciences.

Series note: Obninsk. Fiziko-energeticheskiy institut [Dissertatsii]

TOPIC TAGS: crystal, molecular crystal, exciton, photoconductivity, polaron, luminescence, radiative transfer, crystal defect, reabsorption

PURPOSE AND COVERAGE: The book is intended for physicists, astrophysicists, and scientists working in the field of solid-state physics, atomic and nuclear physics, and physical chemistry. Theoretical investigations of problems associated with the migration of energy of electron excitation in molecular crystals are made. The book consists of two chapters. Chapter I deals with the development of the phenomenological theory of migration of the energy of electron excitation in molecular crystals. Integral-differential equations are solved for the density of excitons in the case of an arbitrary diffusion coefficient.

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cient of excitons and an arbitrary superposition of the emission and absorption spectra in molecular crystals. Chapter II is devoted to the theory of parameters characterizing the exciton mechanism of migration of electron excitation energy in molecular crystals. The length of diffusion displacement of free excitons in molecular crystals is calculated and its temperature dependence is found. The author thanks V. M. Agranovich, M. D. Galanin, V. L. Levshin, and Z. A. Chizhikova. There are 59 references, primarily Soviet.

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- Ch. I. Phenomenological theory of energy migration of electronic excitation in molecular crystals -- 11
1. Basic equations and formulas -- 11
 2. Determination of the luminescence quantum yield when the effect of the internal reflection of light from the crystal surface is not taken into account -- 16
 3. Determination of the average "exponential" de-excitation time when the effect of light reflection from the inner crystal surfaces is not taken into account -- 35
 4. Asymptotic expression for $M(x, z_0)$ and $N(x, z_0)$ functions at

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KONGBEYEVA, G.M.

Some microbiological material on the evolution of soils in the
Kunyadar'inskaya Plain. Izv. AN Uz. SSR no. 7:25-33 '56.

(MIRA 14:5)

(Tashauz Province--Soils)

KONOBEEVA, G. M., Cand Biol Sci (diss) -- "The soils of ancient oases of the Kunya Der'ya plain, and their evolution". Tashkent, 1959. 20 pp (Acad Sci Uzbek SSR, Inst of Soil Science), 175 copies (KL, No 9, 1960, 123)

KONOBEYEVA, G.M.

Changes in the chemical properties of takyrs soils on ancient oases
of the Kunya-Darya Plain following discontinuation of irrigation.
Usb.biol.zhur. no.5:62-69 '59. (MIRA 13:4)

1. Institut pochvovedeniya AN UzSSR.
(DARYALYK VALLEY--SOIL CHEMISTRY)

KONOBEEVA, G.M.

Resistance of some types of soil microorganism to the action of
anabasine. Mikrobiologiya 29 no.2:234-237 Mr-Apr '60. (MIRA 14:7)

1. Institut pochvovedeniya AN UzSSR, Tashkent.
(SOILS--MICRO-ORGANISMS) (ANABASINE)

1. KONOBEYEVA, N. I., BRAGIN, S. M.
2. USSR (600)
4. Cement Kilns
7. Speeding up clinker burning Tsement 18/no. 1, 1952
Inzh. Khilkovskiy Tsementnyy Zavod
9. Monthly List of Russian Accessions, Library of Congress, June 1952.
UNCLASSIFIED

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AUTHOR: Konobeyevskiy, K. S.; Gusel'nikov, L. Ye.; Hamethin, N. S.; Polak, L. S.; Chernysheva, T. I. 52

ORG: Institute of Petrochemical Synthesis, AN SSSR (Institut neftekhimicheskogo sinteza AN SSSR) 3

TITLE: Investigation of radiation polymerization of polyfunctional vinyl-siloxanes 7

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 3, 1966, 553-556

TOPIC TAGS: radiation polymerization, vinyl siloxane, siloxane, monomer, polymer, styrene, graft copolymer, vinyl plastic

ABSTRACT: The paper deals with radiolysis, polymerization, and the effect of Gamma rays on monomeric polyfunctional vinyl siloxanes. The existence of stabilized free radicals confirms its microgel nature. The possibility of preparing graft copolymers is demonstrated by initiating styrene polymerization with microgel of 1, 3, 5-tri-vinyl-1, 3, 5-pentamethyltrisiloxane. Orig. art. has: 3 figures and 1 table. [Based on authors' abstract.] [NT]

SUB CODE: 07/ SUBM DATE: 24Apr65/ ORIG REF: 002/ OTH REF: 006/

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UDC: 66.095.26+678.745

KONOBIEVSKIY, S.T.

"Slip in Crystals in Rolling," Zeitschrift fur Physik, 1927, Vol 43, pp 741-749.

"By a study of Roentgen Pictures of Rolled Al Plate, it is established That Depending on the Degree of Working Two Textures Can Result. The First is Formed on Account of the Slip in the Crystals Along the Rhombic Dodecahedron Surface, the Second Along the Cubic Surface. The Slip must Run Along the Plane (110) to the 211 Axis" Zeitschrift Fur Physik, 1927, Vol 43, pp 741-749, Slip in Crystals in Rolling.

KONOBIEVSKIY, S.T.

"The Solid Solution of Iron-Graphite," Zeitschrift fur Kristallograpie, Kristallphysik, Kristallchemie, 1929, Vol 72, pp 381-397.

"Diffraction Patterns From Some Natural Graphites were duplicated in Samples of Graphite Heated with Fe. Solid soln. of the Fe in the graphite occurs, with the probable formation of Fe_2C . The Presence of 'Superstructure lines' in the Pattern Indicates a Regular Distribution of the Fe Atoms." Zeitschrift fur Kristallograpie, Kristallgeometrie, Kristallphysik, Kristallchemie, 1929, Vol 72, pp 381-397. The Solid Solution of Iron-Graphite.

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<p><i>X-Ray Analysis in Metallurgical Laboratories. N. T. Kozlovskiy (Zarud. Lab. (Works' Lab.), 1933, 2, (3), 3-10).—[In Russian.] A discussion.—N. H. V</i></p>																																																						
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The broadening of the Debye-Scherrer lines on the photograms of metals after cold working and annealing. S. Kucharski and I. Schlich. *Physik. Z. Supplement* 3, 248-251 (1953). — This phenomenon was studied with Cu, Fe, Al, Zn, Mg and the Al-Zn-Mg alloy "Electron AZM." For Mg, the width of the line is an exponential function of the annealing time for temps. below recryst. For "Electron," a triplet instead of the $K\alpha$ doublet is found for high-order lines; this is explained by diffusion of the Al and Zn atoms in the deformed solid-soln. lattice. It is theoretically shown that, in certain temp. intervals, elastic strains can be relieved through a redistribution of the atoms of the components of the solid soln.

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<p><i>Transformation of the α-Phase of Copper-Tin Alloys after Deformation.</i> <i>S. Kombarovskii and V. Tarasova (Fizikal. Z. Sovetskii, 1933, 4, 571-573; C. Abz., 1934, 22, 1254).—[In German.]</i> The work of Westgren and Thragmen on the determination of the phase boundary between the α and the $\alpha + \delta$ phases of the copper-tin system is criticized because W. and P. disregarded the effects of deformation in the X-ray samples. The work is repeated; proper annealing preceded by deformation indicates a decreased solubility of α in δ as the temperature is decreased. It is thought that deformation aids heat in reaching equilibrium by redistributing the components in a metastable state, thus increasing the diffusion potential.—S. G.</p>																																																			
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<div style="display: flex; justify-content: space-between;"> 277 9 </div> <div style="text-align: center; padding: 20px;"> <p>Precision Methods for X-Ray Examination of Metals. S. T. Konobievskii <i>(Zavodskaya Lab., 1933, (6), 23-25; C. Abn., 1934, 23, 7194).</i>—[In Russian.] A general discussion of the apparatus and a few examples of the application of the method.—S. G.</p> </div>																			
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M	2	<p>*On the Solubility Limits of the α-Phase in Copper-Tin Alloys. N. T. Kunguzovskiy and V. P. Tarasova (<i>Zhurнал khimicheskoy fiziki [J. Exptl. and Theoret. Physics]</i>, 1934, 4, 272-291).—[In Russian.] Annealing of copper-tin alloys at 300° C. results in the decomposition of the α-solid solution with separation of a new phase and change in concentration from 8.5 to 4 atomic-% tin. The solubility of tin in the α solid solution at 650°, 500°, and 400° C. is 8.4, at 410° C. 8.0, at 345° C. 7.2, at 343° C. 6.5, at 325° C. 6.1, and at 300° C. 4.1 atomic-% tin. From the point of view of the mechanism of the diffusion process the presence of heterogeneous stresses in the deformed crystals must give rise in a certain temperature range to definite concentration currents and therefore to the separation of nuclei of the excess solute. The shape of the solubility curve obtained is explained by assuming that the solid solution of tin in copper in the equilibrium state must obey the general thermodynamic expression for solutions: $\ln \gamma_1 = -\frac{Q}{RT} + C$ and that the boundary curve corresponds with the equilibrium of the δ (γ) phase with the α-solid solution of a definite degree of supersaturation determined by the size of the separated δ (γ) particles. On the basis of three hypotheses the size and number of the crystals formed during decomposition have been determined in relation to the annealing temperature and degree of supersaturation. Theoretical calculations have also been made of the rate of dissolution of the δ (γ) phase in relation to the annealing temperature and compared with the experimental figures.—N. A.</p>			
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KONOBIEVSKIY, S.T.

"The Theory of Supercooled Solid Solutions," Zeitschrift fur Physikalische Chemie, 1934, Vol 171, pp 25-35.

"The Conditions Governing the Stability of Solid Solns. as well as Several Questions Concerning the Sepn. Process (the Preparatory Phase in the Sepn. Process and Oriented Sepn.) are Discussed on the Basis of the Theory of Supercooling." Zeitschrift fur Physikalische Chemie, 1934, Vol 171, pp 25-35, The Theory of Supercooled Solid Solutions.

1ST AND 2ND GROUPS										3RD AND 4TH GROUPS									
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<p>*Decomposition of Solid Solutions of Copper in Aluminium as the Result of Plastic Deformation and Subsequent Annealing. M. I. Zacharova and S. T. Konobrevskiy. (Zhurnal Tekhnicheskoy Fiziki (J. Tech. Physics), 1935, 8, (7), 1134-1144).—[In Russian.] The decomposition of supersaturated solid solutions of copper in aluminium has been investigated on lines similar to those employed in the case of the silicon solution (cf. Met. Abs., this vol., p. 670).</p> <p style="text-align: right;">—N. A.</p>																			
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PROCESSES AND PROPERTIES INDEX																			
<p><i>11</i></p> <p><i>13</i></p> <p>Konobajewski, S. G. Konobajewski, und W. Tuzianowski. <i>Die Röntgenographie in ihre Anwendung zur Materialprüfung.</i> Pp. xv + 568. 1930. Moscow and Leningrad. Ontl. (Rbl. 12.)</p>																			
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Sov. Khim.

Theoretical construction of the diagram of state of alloys of some metals. N. T. Komarovskii. *Bull. Acad. Sci. U. R. S. S., Classe sci. math. nat., Sér. chim.* No. 2, 255-257 (in French 267-70) (1965). -- Four types of only limits of solid soln. were studied: (1) This type is represented by a curve convex upward, and at low temps. approaching asymptotically the y-axis. The equation of this curve is $\ln A = (A/T) + B$, in which S is only, T abs. temp., and A and B are const. Examples of this type are the systems Al-Cu and Al-Mg. (2) This type is described by a vertical curve, examples of which are brass and Al-brasses. (3) Cu-Sn and Ni-Sn are of a 3rd type and are represented by only curves possessing inflections. (4) This type is illustrated by Cd-Sn, which alloy within certain temp. limits shows a stratification characteristic of a solid soln. The fundamental thermodynamic function deg. the state of a system in the equil. condition is the thermodynamic potential, which for condensed systems can be replaced by the free energy, as $T = U_0 - TS_0$; the entropy S_0 at 0°K. is $S_0 = R/c \ln c + (1-c) \ln (1-c)$ in which c is the concn. H. H. Mesrobian

ASB-514 METALLURGICAL LITERATURE CLASSIFICATION

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***The Equilibrium Diagram of Cu-Zn at Low Temperatures.** S. Kombejczyk and W. Tarnowski (*Physikal. Z. Sowjetunion*, 1930, 10, (3), 427-428). [In German.] It has been established, since 1934 (*Sov. Physics*, 1930, 8, 838 and *Z. Metallkunde*, 1936, 26, 73) that the solubility of the α -phase of the bronzes is dependent on the temperature and is much smaller at low than at high temperatures. A corresponding result has now been established for the solubility of the α -phase of the bronzes. The solubility is found to decrease from 38.75% of zinc (by weight) at 400° C. to 33.35% at 167° C. The equilibrium diagram of the bronzes in the region of the α , α + β boundary resembles, in its concavity, the corresponding part of the equilibrium diagram of the bronzes. —J. S. U. T.

434 554 METALLURGICAL LITERATURE CLASSIFICATION

KONOBAYEVSKIY, S. T.

"Application of the Quantum Theory of Metals to Phase Equilibrium in Metals,"
Annalen der Physik, 1936, Vol 26, pp 97-115.

"The existing data on the structure and regions of stability of the phases of the Hume-Rothery type leads to the conclusion that the phases should be considered not as chemical compds. with definite chem. formulas but as true intermetallic phases of variable compn. The stability of these phases is limited by the quality of the electron gas of a given compn. that gives an energy min. with a definite crystal structure. The free energies of solid solns. were detd. (1) through the change in entropy in increasing in concn. of the solid soln., (2) through the increase in energy as a consequence of the quantum conditions of the electrons of the lattice. From the Bloch-Brillouin theory in the electrons of the lattice of the solid soln., the peculiar min. (thermodynamic potential) in the curve of total energy can be calcd. The min. can be connected with the appearance of addnl. binding forces (Hume-Rothery affinity) at definite concns. in the compound. The size of the min. is proportional to the order of the magnitude of the thermal effects produced in alloying the metals. The use of the theory for calcg. the course of the soly. for the a-phases gives results that are qualitatively in good agreement with exptl. data. Such concns. were applied to the Cu-Sn, Ni-Sn, Cu-Be, and Sn-Cd systems. Such calcns. permit predicting the possibility of transformations in solid solns. alloys with variable concns. of valence electrons." Annalen der Physik, 1936, Vol 26, pp 97-115, Application of the Quantum Theory of Metals to Phase Equilibrium in Metals.

PERIODIC TABLE OF ELEMENTS																									
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<div style="display: flex; justify-content: space-between;"> BC A-1 </div> <div style="text-align: center; margin-top: 100px;"> <p>Alteration of the atomic lattice by plastic deformation in crystals. S. T. Kuznetsov (Dokl. Acad. Sci. U.R.S.S., Ser. Phys., 1937, 845).— A summary. I. McA.</p> <p>12-Ak.Nauk SSSR, Ser. Fiz.</p> </div>																									
<div style="display: flex; justify-content: space-between;"> <div> <p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p> <p>CLASSIFICATION</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100</p> </div> <div> <p>DESCRIPTIVE INDEX</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100</p> </div> </div>																									

Crystallization in Metals by Transformation in the Solid State. S. T. Konobeevskii (Izv. Akad. Nauk S.S.S.R. (Bull. Acad. Sci. U.S.S.R.), 1967, (Chim.), (8), 1240-1244).—[In Russian, with English summary].—The crystallization theory of Gibbs and Volmer explains many aspects of phase recrystallization. A general review of the effect is given, and results of experiments on the kinetics of the decomposition of a solid solution are recorded. The transformations take place either during a gradual change of the concentration of the solid solution or spontaneously in definite parts of the crystallites. Deformation, in the same way as a temperature increase, favours the gradual type of transformation, as it accelerates diffusion. The curves of change in hardness and lattice parameter with time caused by spontaneous decomposition consist of three sections, corresponding to incubation period, abrupt change of curve (kink), and region of coagulation. As the crystallization occurs far below the melting point, when atoms move slowly, these stages correspond to three periods: (1) that of preparation, (2) that of formation of nuclei and their growth up to the size which is in a metastable equilibrium with the supersaturated solution, and (3) that of the growth of some grains at the expense of others (coagulation). M. I. Chertok's experiments show that the formation of gray tin nuclei in white tin at low temperatures takes place with ever-increasing velocity. This is due to the autocatalytic effect of atoms produced by the difference of densities of the tin modifications. These atoms also account for the relatively high speed of the spontaneous transformation of tin. The speed of the spontaneous transformation is $W' = 2\pi N^2 W$, l being the width of the deformation zone, N the number of nuclei per unit volume of the zone, and W the rate of linear growth of a grain. For the growth of crystals in a solid solution, the expression is derived: $s^2 = \frac{D}{(C_p - C_0)t}$, where s is a measure of the crystal size, C_p the concentration of the crystals, C_0 the initial concentration, and t the time. During the coagulation period the growth of crystals is determined not only by diffusion but also by the size of the crystal particles. K's and G. A. Golder's experiments show that the inter-diffusion of nickel in copper in thin layers is some hundred times quicker than the ordinary diffusion. This effect is due to a plastic deformation of copper at heating caused by the difference of the coefficients of dilatation of nickel and copper. The anomalous change of the electric resistance associated with the precipitation is due to a change of the mean free path of the electrons and can attain several per cent. if the grain is about 10^{-4} cm. large.—N. A.

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<div style="display: flex; justify-content: space-between;"> M 2 </div> <p>"The Equilibrium Diagram for the System Cu-Sn and the Transformations Associated with the Decomposition of the Solid Solution α." S. T. Kuroshvaki and W. P. Tarasova (<i>U.S.S.R. Physicochemistry</i> U.S.S.R., 1937, 6, (6), 781-786).— [In English.] The equilibrium lines between the region of α-solid solution and the two-phase regions $\alpha + \gamma$ and $\alpha + \epsilon$ were determined by X-ray crystal analysis. An intermediate phase, ϵ', which is liberated from the solid solution, α, below 200° C., was detected and studied. The present results agree best with those obtained by Haase and Pawlek (<i>Met. Abs.</i>, 1936, 2, 198). The lattice of the ϵ'-phase is found to constitute a rhombic cell with 32 atoms.—J. S. G. T.</p>																																																			
<div style="display: flex; justify-content: space-between;"> <div> <p>ASB-15A METALLURGICAL LITERATURE CLASSIFICATION</p> <p>15000 15100 15200 15300 15400 15500 15600 15700 15800 15900 16000 16100 16200 16300 16400 16500 16600 16700 16800 16900 17000 17100 17200 17300 17400 17500 17600 17700 17800 17900 18000 18100 18200 18300 18400 18500 18600 18700 18800 18900 19000 19100 19200 19300 19400 19500 19600 19700 19800 19900 20000 20100 20200 20300 20400 20500 20600 20700 20800 20900 21000 21100 21200 21300 21400 21500 21600 21700 21800 21900 22000 22100 22200 22300 22400 22500 22600 22700 22800 22900 23000 23100 23200 23300 23400 23500 23600 23700 23800 23900 24000 24100 24200 24300 24400 24500 24600 24700 24800 24900 25000 25100 25200 25300 25400 25500 25600 25700 25800 25900 26000 26100 26200 26300 26400 26500 26600 26700 26800 26900 27000 27100 27200 27300 27400 27500 27600 27700 27800 27900 28000 28100 28200 28300 28400 28500 28600 28700 28800 28900 29000 29100 29200 29300 29400 29500 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<p>*Determination of the Limiting Solubility of the α-Phase in the Ternary System Copper-Zinc-Tin at Low Temperatures by the Method of X-Ray Analysis. R. T. Kozlovskii, W. P. Tarasova, and A. A. Stepanova (<i>Acta Physicochimica U.S.S.R.</i>, 1957, 6, (6), 790-814).—[In English.] The transformation of the solid solution of the α-phase in the copper-zinc-tin system of alloys on annealing in different initial states (after quenching, on slow cooling, and after straining) was studied. In strained samples the process of decomposition is considerably accelerated. The solid solution boundary is plotted in three isothermal sections corresponding to 540°, 350°, and 310° C.—J. S. G. T.</p>																																																																																																																																																											
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Diagram of state and transformations occurring in the decomposition of the α solid solution in the copper-tin alloys. S. T. KONOBREYSKI and V. P. TARASOVA (J. Phys. Chem. Russ., 1937, 9, 681-692).—The relation of the α -phase to $\alpha + \gamma$ and $\alpha + \epsilon$ has been determined by X-ray analysis. An intermediate phase ϵ' has been found; it is formed in the transformation $\gamma \rightarrow \epsilon$ and separates from the α solid solution above 380° ; its lattice corresponds with a rhombic cell containing 32 atoms. E. R.

Zhu-Fiz. Khim

Moscow State Univ., Ser. Phys., Inst. Physics

ASD-32A METALLURGICAL LITERATURE CLASSIFICATION

BC A-1

1ST AND 2ND ORDER PROCESSING AND PROPERTIES INDEX

X-Ray determination of the solubility of the ϵ -phase in the ternary system copper-nickel-tin at low temperatures. A. T. KONONOVSKI, V. P. TARASOVA, and A. A. STREKOVA (J. Phys. Chem. Russ., 1957, 31, 693-703).—The transformation of the ϵ -phase on annealing has been studied in relation to previous thermal and mechanical treatment (quenching, slow cooling, deformation). The transformation is accelerated by deformation. E. R.

Moscow State Univ. Inst. Phys. Chem. Lib. Moscow

ASB-51A METALLURGICAL LITERATURE CLASSIFICATION

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1ST AND 2ND QUANTITIES		PROCESSES AND PROPERTIES INDEX		100 AND 10M CODES	
M		<p>The Nature of Solid Solutions and the Inner Transformations Taking Place in Them. S. T. Kuznetsovskii (Zhurnal Nauch. Issledov. Sektii Metallovedeniya i Termicheskoy Obrabotki VNITO Metallurgov (Coll. Sci. Rep. Div. Metal-Production and Heat Treatment of the All-Union Scientific Engineering and Technical Society of Metallurgists), 1948, 10-34; Khim. Referat. Zhur., 1941, 4, (3), 11; C. Abc., 1943, 27, 3049).—[In Russian.] The importance of X-rays in the study of solid solutions and the application of the quantum theory to metallurgy, are described briefly. The atomic structure of solid solutions, their electronic structures, and the inner transformations within solid solutions, are discussed. Diffusion in cold-deformed solid solutions is described in detail.</p>		2	
<p>ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>					
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KONOBEYEVSKIY, S. T.

"Theory of Phase Transformations. I Thermodynamic Theory of the Phenomenon of Restoration or Reversal During the Ageing of Aluminium Copper Alloys." Zhur. Eksper. i Teor. Fiz., 13, 6, 185-99, 1943.

KONOBEYEVSKIY, S. T. APPROVED FOR RELEASE: 06/19/2000

CIA-RDP86-00513R000824310012-

"Theory of Phase Transformations." II. "Diffusion in Solid Solutions Under the Influence of Distributed Tensile Stresses," Moskva Nauchno Issledovatel'skii Institut Fiziki M.G.U.)

Theoretical-mathematical. One of the possible methods of determining the weakening of the internal strains in solid solutions deformed at low temperatures as a result of diffusion is considered. A Theory of the Phenomenon is given and, from this point of view, various experimental facts are explained." Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki, 1943, Vol 13, No. 6, pp 200-214, Theory of Phase Transformations. II. Diffusion in Solid Solutions Under the Influence of Distributed Tensile Stresses (Moskva Nauchno Issledovatel'skii Institut Fiziki M.G.U.).

1ST AND 2ND GROUPS										3RD AND 4TH GROUPS										5TH AND 6TH GROUPS									
PROCESSES AND PROPERTIES INDEX																													
<p>M</p> <p>Theory of phase transformations. III--Stresses Resulting from the Separation of Phases from a Solid Solution. S. S. Konobeevsky (Zhur. Eksper. Teoret. Fiziki, 1943, 13, (11/12), 418427; C Abs., 1945, 89 1095) (In Russian) Cf. ibid., (6) 185,200; Met. Abs., this vol. p.108 The deformation and tension resulting when a spherical crystal of different composition and specific volume separates from a solid solution are calculated. In the case of the aluminium-copper system "elastic" separation of phases may occur; in the case of the silver-copper system it cannot. The tensions produced set up diffusion currents that increase the rate of growth of the crystalline nuclei formed. The crystallization of a metal is then an auto catalytic process.</p>																													
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PRECEDENCE AND PRIORITY INDEX																									
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<p><i>On the Theory of Substitutional Solid Solutions. M. T. Kuznetsov (Izv. Akad. Nauk SSSR, 1962, 10, (1), 10-23). (In Russian). The results obtained by Kuznetsov (Dissertation, 1961) in a theoretical calculation of the wave functions and energies in the ordered β-brass lattice, are given. The field of the Cu^+ ion was obtained from the work of Hartree, while the field of the Zn^{++} ion was derived by the method of interpolation. The problem can be solved only by a series of successive approximations. As a first approximation, the interaction of an electron with the field of two neighbouring atoms was considered. The wave function was sought only in the directions of the cube and octahedron, since it had been ascertained that the Schrödinger equation could be integrated in one dimension. The results of the first approximation give reasonably accurate information regarding the distribution of the valency electrons between the atoms of copper and zinc and regarding the broad significance of the lattice const. of the alloy, but there is no claim that they give accurately the magnitude of the energy. A large part of the valency electrons is found in association with the zinc atoms and a small part with the copper atoms. The charges on zinc and copper are approx.: $Q_{\text{Cu}} = (-0.006-1)$, $Q_{\text{Zn}} = (+0.006-2)$. By means of a systematic survey of the boundaries of the β- and γ-phase fields in alloys of uni- and zero-valent metals in zinc and aluminium, a general law was established, viz. the constancy of the coeff. of filling of the Hückel's atom at the limiting saturation of the phase. An explanation is given of the existence of "defect" lattices (formation of vacant sites in the lattice) from the point of view of Jones's theory. (General thermodynamic considerations permit a relationship to be established between the dependence of the thermodynamic potential on concentration and the course of the boundary of a solid solution. Comparison of calculated with experimental data for a solid solution of copper shows that an extra minimum exists on the thermodynamic-potential curve; this can be explained by the electron theory of solid solutions.—N. A.</i></p>																									

KONOBAYEVSKIY, S.T.

"A Thermodynamical Theory of Restoration Phenomena in the Aging of Cu-Al Alloys,"
Journal of the Institute of Metals, 1943, Vol 69, pp 397-413.

"The high dispersion of Cu-Al₂ permits a metastable equilibrium in slightly supersaturated solns. Restoration results from resoln. of CuAl₂ in increase of temp. Dimensions of equil. nuclei are independent of the total concn; the number of pptd. crystals depends upon initial concn. of the solid soln. since this concn. det. crit. magnitude of the nucleus and energy of formation of the phase. Dimensions of the equil. crystal found during normal aging are diam. $2r \cdot 10^{-7}$ cm. and thickness $d \cdot 3 \times 10^{-8}$ cm. In the 5 and 2% Cu alloys the number of crystals in the pptd. phase is 1.3×10^{20} and 0.5×10^{20} per g., resp. Specific surface energy is $\sigma = 0.75 \times 10^{-5}$ cal. per sq. cm." Journal of the Institute of Metals, 1943, Vol 69, pp 397-413.
A Thermodynamical Theory of Restoration Phenomena in the Aging of Cu-Al Alloys.

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PROCESSES AND PROPERTIES INDEX																																																			
<p>On Some New Problems in X-Ray Structure Analysis. S. T. Kopylovsky <i>(Izv. Akad. Nauk S.S.S.R., 1966, (VII), 18, (4), 371-379).—(In Russian).</i> In a review based on his own work, K. discusses the thermal scattering of X-rays, the calculation of the dimensions of the Guinier-Preston zones for the S' phase precipitated from the solid solution of copper and magnesium in aluminium ($L_s \approx 7 \times 10^{-6}$, $L_p \approx 30 \times 10^{-6}$, $L_c > 100 \times 10^{-6}$ cm.), and the treatment of an X-ray photograph as the energy spectrum of a crystal.—N.A.</p>																																																			
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KONOBREYEVSKIY, S.T.

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A CONTRIBUTION TO THE MECHANISM OF CONDENSING METALS (ZINC, CADMIUM, MAGNESIUM, AND BERYLLIUM) FROM VAPOURS. S. KONOBREYEVSKIY AND M. UMANSKY (J. PHYSICS (U.S.S.R.) 1946, 10 (4) 366) (In English) Thin layers of zinc, cadmium, magnesium, and beryllium, produced by condensation in vacuo, exhibit orientations varying over the surface according to the angle of incidence of the molecular beam. For a normally incident beam of zinc atoms, an axially symmetrical texture is formed; the hexagonal axis of the zinc crystal is normal to the surface. For oblique beams, the (100) plane coincides with the plane passing through the direction of the beam and that of the normal to the surface. The hexagonal axis lies in this plane. It is suggested that crystalline nuclei are formed before contact is made with the surface upon which the metal is condensed. GVR

ASB 35.4 METALLURGICAL LITERATURE CLASSIFICATION